"198. Dicranum congestum. High sandy hills; Boyne Falls, July 30. (Hills southeast of the village, 325 feet above Lake Michigan.) On the ground; loosely cæspitose."

Boyne Falls is in Michigan, and Mich. is placed after the name in connection with the first plant collected there.

At the time of placing a plant in the drying papers a card is put with it, corresponding to the number in the note book as "198. 78. Dicranum congestum." The latter number gives the year. This card is kept with the specimen till mounted. When mounted, by turning to the corresponding number in the diary, any particulars needed for the label may be found. When a plant is dried for the herbarium an entry is also made on the margin of the page of the botany used in identifying, using the last two numbers of the year in which it is collected. Opening my copy of Gray's Manual to Hippuris vulgaris, on the margin are found three numbers, "78, 80, 83." If any information is wanted this becomes an index to show where the information may be found. It saves much time to look it up here instead of in the cabinet, if the specimen itself is not needed. The number on the margin serves also as a record or check list of plants, so that it may not be repeatedly gathered, unless special reasons exist for it.

Note books kept in this way become very useful in the study of geographical distribution. It is an exact record, easy of access. The system is a kind of botanical book keeping, as useful and accurate in its way as that of the accountant.—E. J. Hill.

Collecting Fossil Plants.—Fossil plants are to be looked for in the shale above the coal veins, and sometimes in the stigmaria clay below. In the subconglomerate coal measures of Arkansas the impressions occur in the shale within 18 inches of the coal. The best are found from 8 to 18 inches above. But few forms are found above 12 inches. Close to the coal is a layer of fragile shale a few inches thick, filled with indeterminable fragments, but sometimes yielding species not found in the firmer rock above. The impressions near the coal are never good, being nearly the color of the shale and much broken. To get the entire range of species it is best to examine all the shale from the coal to the barren rock above, at as many localities as possible. Carboniferous plants grow in clumps as they do in our modern swamps, and were often local. Species collected once at a locality may never be found again, and suddenly a dozen new ones may appear. Always save poor specimens of new or doubtful forms, but discard the small fragments of well-known and common species. Reverses, unless large and fine, are worthless. Break open any nodules found, as they often contain plant remains. Keep all the parts of an impression together when broken, as they may be mended by cement, or set in position in a plaster of Paris base. Better leave considerable shale with a good impression than run the risk of breaking it by trimming.

In shaping, a meat saw can be used to good advantage on fragile shales free from nodules. A pair of pincers is useful, also a wooden clamp to prevent forcing while trimming with a hammer. Shale from the coal measures of Arkansas, if dried either in the sun or shade without being exposed to rain, will

not crumble, and will become firmer by drying. Shales containing iron pyrites are liable to crumble from oxidation.

Shales work easier when first taken out, as they are wet, but are more liable to crumble in splitting. While drying out lines of cleavage are developed, showing where to put the chisel to expose the best impressions. Promising shale can be stored away in a dry place and worked over at leisure. Different species occur in the shale at different levels, and experience soon teaches one how to work the shale for particular forms.

For collecting fossils, one needs a crow-bar, shovel or spade, pickaxe, and blasting material, if he is searching at a locality not worked. If at a mine in operation the above tools, if needed, can generally be borrowed from the miners. Several steel chisels from $\frac{1}{2}$ to 1 inch wide and 8 inches long, and as thin as possible, are necessary, also one heavy and one light hammer. In splitting small shales a strong butcher knife and a light hammer have been used to good purpose. In opening large shales to expose surfaces it is best to insert several chisels along the supposed line of fracture and work continuously. The impressions should never be touched with the fingers as they are easily dimmed. Cigar boxes for small specimens and fragile pieces, and larger boxes for heavier shales are necessary. All specimens should be wrapped in paper and tightly packed on edge, and all the interstices filled with paper, sawdust, leaves or any available packing material.

Essential requisites in forming a cabinet of fossil plants are patience and perseverance on the part of the collector. He must be content to split shale all day in the hot sun or bitter cold, and often go home with empty boxes. Specimens in the cabinet should be laid flat in drawers, such as are used for minerals, or in show cases, if designed for exhibition. They are necessarily fragmentary, and a number of specimens of each form is desirable. The specimens must be numbered, to correspond with those of a record book, in which all data are given. A card placed with each specimen states where it is figured and described, and the front of the drawer is labeled with the contained genus and species. The color of the label can be made to indicate the group, as blue for ferns, etc. The specimens should never be wet, oiled, or varnished.—F. L. HARVEY.

The directions which Prof. Harvey gives for collecting in carboniferous strata apply in the main to all formations.

Drying plants out of doors in wet weather.—For 30 years I have collected plants in both wet and dry climates and of necessity have tried many plans. At present I have, I think, a perfect system and as it is all original I will give it in full. I have tried all other plans and none meets every case but my own. When out collecting I gather flowering plants in dry weather, and lichens, mosses and liverworts wet, especially lichens. My driers are either newspapers or the usual ones advertised in the GAZETTE. I collect cryptogams in a basket, and afterwards sort them and place them in flattened pieces or tufts on single sheets of paper of a slightly smaller size than the driers. I fill each sheet, taking no account of species, and place on it a slip with the date. I place each sheet between driers and when all are assorted I place the pile between boards and put on the pressure with leather straps.